

【配列表】
SEQUENCE LISTING

<110> NARA INSTITUTE OF SCIENCE AND TECHNOLOGY

<120> Multiple use of caffeine biosynthetic genes

<130> 19-025

<140>

<141>

<150> JP 2002-213655

<151> 2002-07-23

<160> 9

<170> Microsoft Word

<210> 1

<211> 372

<212> PRT

<300>

<301> Ogawa, M., Heraï, Y., Koizumi, N., Kusano, T., and Sano, H.

<302> 7-Methylxanthine Methyltransferase of Coffee Plants. Gene Isolation and Enzymatic Properties.

<303> Journal of Biological Chemistry

<304> 276

<305> 11

<306> 8213-8218

<307> 2001-03-16

<308> BAB39215

<309> 2000-09-11

<400> 1

Met Glu Leu Gln Glu Val Leu Arg Met Asn Gly Gly Glu Gly 14

Asp Thr Ser Tyr Ala Lys Asn Ser Ala Tyr Asn Gln Leu Val 28

Leu Ala Lys Val Lys Pro Val Leu Glu Gln Cys Val Arg Glu 42

Leu Leu Arg Ala Asn Leu Pro Asn Ile Asn Lys Cys Ile Lys 56

Val Ala Asp Leu Gly Cys Ala Ser Gly Pro Asn Thr Leu Leu 70

Thr Val Arg Asp Ile Val Gln Ser Ile Asp Lys Val Gly Gln 84

Glu Lys Lys Asn Glu Leu Glu Arg Pro Thr Ile Gln Ile Phe 98

Leu Asn Asp Leu Phe Pro Asn Asp Phe Asn Ser Val Phe Lys 112

Leu Leu Pro Ser Phe Tyr Arg Lys Leu Glu Lys Glu Asn Gly	126
Arg Lys Ile Gly Ser Cys Leu Ile Gly Ala Met Pro Gly Ser	140
Phe Tyr Ser Arg Leu Phe Pro Glu Glu Ser Met His Phe Leu	154
His Ser Cys Tyr Cys Leu Gln Trp Leu Ser Gln Val Pro Ser	168
Gly Leu Val Thr Glu Leu Gly Ile Ser Thr Asn Lys Gly Ser	182
Ile Tyr Ser Ser Lys Ala Ser Arg Leu Pro Val Gln Lys Ala	196
Tyr Leu Asp Gln Phe Thr Lys Asp Phe Thr Thr Phe Leu Arg	210
Ile His Ser Glu Glu Leu Phe Ser His Gly Arg Met Leu Leu	224
Thr Cys Ile Cys Lys Gly Val Glu Leu Asp Ala Arg Asn Ala	238
Ile Asp Leu Leu Glu Met Ala Ile Asn Asp Leu Val Val Glu	252
Gly His Leu Glu Glu Glu Lys Leu Asp Ser Phe Asn Leu Pro	266
Val Tyr Ile Pro Ser Ala Glu Glu Val Lys Cys Ile Val Glu	280
Glu Glu Gly Ser Phe Glu Ile Leu Tyr Leu Glu Thr Phe Lys	294
Val Leu Tyr Asp Ala Gly Phe Ser Ile Asp Asp Glu His Ile	308
Lys Ala Glu Tyr Val Ala Ser Ser Val Arg Ala Val Tyr Glu	322
Pro Ile Leu Ala Ser His Phe Gly Glu Ala Ile Ile Pro Asp	336
Ile Phe His Arg Phe Ala Lys His Ala Ala Lys Val Leu Pro	350
Leu Gly Lys Gly Phe Tyr Asn Asn Leu Ile Ile Ser Leu Ala	364
Lys Lys Pro Glu Lys Ser Asp Val	372

<210> 2

<211> 1316

<212> DNA

<213> Coffea arabica

<220>

<221> CDS

<222> (45) ... (1163)

<300>

<308> AB048793

<309> 2000-09-11

<400> 2

ctttggcagt cccaatttga tttatgtaca agtcctgcat atgaatggag	50
--------------------------------------------------------	----

ctccaagaag tcctgcggat gaatggaggc gaaggcgata caagctacgc	100
caagaattca gcctacaatc aactggttct cgccaaggig aaacctgtcc	150
ttgaacaatg cgtacgggaa ttgttcggg ccaacttgcc caacatcaac	200
aagtgcatta aagttgcgga ttgggatgc gcttctggac caaacacact	250
ttaacagtt cgggacattg tccaaagtat tgacaaagtt ggccaggaaa	300
agaagaatga attagaacgt cccaccattc agatttttct gaatgatctt	350
ttcccaaag atttcaattc ggttttcaag ttgctgcaa gcttctaccg	400
caaacttgag aaagaaaatg gacgcaaat aggatcgtgc ctaatagggg	450
caatgcccgg ctctttctac agcagactct tccccgagga gtccatgcat	500
tttttacct cttgttactg tcttcaatgg ttatctcagg ttcctagcgg	550
tttggtgact gaattgggga tcagtacgaa caaagggagc atttactctt	600
ccaaagcaag tcgtctgccc gtccagaagg catatttgga tcaatttacg	650
aaagatttta ccacatttct aaggattcat tcggaagagt tgttttaca	700
tggccgaatg ctcttactt gcatttgtaa aggagtigaa ttagacgccc	750
ggaatgccat agacttactt gagatggcaa taaacgactt ggttggtgag	800
ggacatctgg aggaagaaaa attggatagt ttcaatcttc cagtctatat	850
accttcagca gaagaagtaa agtgcatagt tgaggaggaa ggttcttttg	900
aaattttata cctggagact ttaagggtcc ttacgatgc tggcttctct	950
attgacgatg aacatattaa agcagagtat gttgcatctt ccgttagagc	1000
agttttacgaa cccatcctcg caagtcattt tggagaagct attatactg	1050
acatattcca caggtttgcg aagcatgcag caaaggttct ccccttgggc	1100
aaaggcttct ataataatct tatcatttct ctgcgcaaaa agccagagaa	1150
gtcagacgtg taaaagtttg tttttgtgtt ggggaaagga ataagtccg	1200
ttgggggtct ttcgggtatt gtgcttttta tattatattg ttttgtatcc	1250
gtaataaaaag tgggtgtgaa gaataagata ttgacatat attattttca	1300
aaaaaaaaa aaaaaa	1316

<210> 3

<211> 1316

<212> RNA
 <213> Coffea arabica

<220>
 <221> CDS
 <222> (45)... (1163)

<300>
 <308> AB048793
 <309> 2000-09-11

<400> 3

cuuuggcagu cccaauuuga uuuuuguaca aguccugcau augaaggag	50
cuccaagaag uccugcggau gaauggagc gaaggcgaua caagcuacgc	100
caagaauuca gccuacaau c acugguucu cgccaaggug aaaccugucc	150
uugaacaau cguacgggaa uuguugcggg ccaacuugcc caacaucaac	200
aagugcauua aaguugcggg uuugggaugc gcuucuggac caaacacacu	250
uuuaacaguu cgggacauug uccaaaguau ugacaaaguu ggccaggaaa	300
agaagaaua auuagaacgu cccaccauuc agauuuuucu gaauaucuu	350
uucccaauug auuucaauuc gguuuucaag uugcugccaa gcuucuaccg	400
caaacuugag aaagaaaau gacgcaaaau aggaucgugc cuaauagggg	450
caaugcccg cucuuuuac agcagacucu uccccgagga guccaugcau	500
uuuuuacacu cuuguuacug ucuucaaugg uuaucucagg uuccuagcgg	550
uuuggugacu gaauugggga ucaguacgaa caaaggagc auuuacucu	600
ccaaagcaag ucgucugccc guccagaagg cauauuugga ucaauuuacg	650
aaagaauua ccacauuucu aaggauucau ucggaagagu uguuuucaca	700
uggccgaug cuccuuacu gcauuuguua aggaguugaa uuagacgcc	750
ggaaugccau agacuuacu gagauggcaa uaaacgacu gguuguugag	800
ggacaucugg aggaagaaaa auuggauagu uucaaucuuc cagucuaau	850
accuucagca gaagaaguua agugcauagu ugaggaggaa gguucuuuug	900
aaaauuuaa ccuggagacu uuuaaggucc uuucgaugc ugguucucu	950
auugacgaug aacauuuua agcagaguau guugcaucu ccguuagagc	1000
aguuuacgaa ccauccucg caagucuuu uggagaagcu auuauaccug	1050

acauauucca cagguuugcg aagcaugcag caaagguucu ccccuugggc	1100
aaaggcuucu auaauaaucu uaucauuucu cucgccaaaa agccagagaa	1150
gucagacgug uaaaaguuug uuuuuguguu ggggaaagga auaagugccg	1200
uugggggucu uucggguuuu gugcuuuuuu uauuauauug uuuuguaucc	1250
guauuaaaag ugguguguaa gaauaagaua uuugacauau auuauuuuca	1300
aaaaaaaaa aaaaaa	1316

<210> 4

<211>

<212> PRT

<213> Coffea arabica

<400> 4

Met Glu Leu Gln Glu Val Leu His Met Asn Glu Gly Glu Gly	14
Asp Thr Ser Tyr Ala Lys Asn Ala Ser Tyr Asn Leu Ala Leu	28
Ala Lys Val Lys Pro Phe Leu Glu Gln Cys Ile Arg Glu Leu	42
Leu Arg Ala Asn Leu Pro Asn Ile Asn Lys Cys Ile Lys Val	56
Ala Asp Leu Gly Cys Ala Ser Gly Pro Asn Thr Leu Leu Thr	70
Val Arg Asp Ile Val Gln Ser Ile Asp Lys Val Gly Gln Glu	84
Glu Lys Asn Glu Leu Glu Arg Pro Thr Ile Gln Ile Phe Leu	98
Asn Asp Leu Phe Gln Asn Asp Phe Asn Ser Val Phe Lys Leu	112
Leu Pro Ser Phe Tyr Arg Lys Leu Glu Lys Glu Asn Gly Arg	126
Lys Ile Gly Ser Cys Leu Ile Ser Ala Met Pro Gly Ser Phe	140
Tyr Gly Arg Leu Phe Pro Glu Glu Ser Met His Phe Leu His	154
Ser Cys Tyr Ser Val His Trp Leu Ser Gln Val Pro Ser Gly	168
Leu Val Ile Glu Leu Gly Ile Gly Ala Asn Lys Gly Ser Ile	182
Tyr Ser Ser Lys Ala Ser Arg Pro Pro Val Gln Lys Ala Tyr	196
Leu Asp Gln Phe Thr Lys Asp Phe Thr Thr Phe Leu Arg Ile	210
His Ser Lys Glu Leu Phe Ser Arg Gly Arg Met Leu Leu Thr	224
Cys Ile Cys Lys Val Asp Glu Tyr Asp Glu Pro Asn Pro Leu	238
Asp Leu Leu Asp Met Ala Ile Asn Asp Leu Ile Val Glu Gly	252

His Leu Glu Glu Glu Lys Leu Ala Ser Phe Asn Leu Pro Phe	266
Phe Thr Pro Ser Ala Glu Glu Val Lys Cys Ile Val Glu Glu	280
Glu Gly Ser Phe Glu Ile Leu Tyr Leu Glu Thr Phe Lys Ala	294
His Tyr Asp Ala Gly Phe Ser Ile Asp Asp Asp Tyr Pro Val	308
Arg Ser His Phe Gln Val Tyr Gly Asp Glu His Ile Lys Ala	322
Glu Tyr Val Ala Ser Leu Ile Arg Ser Val Tyr Glu Pro Ile	336
Leu Ala Ser His Phe Gly Glu Ala Ile Met Pro Asp Leu Phe	350
His Arg Leu Ala Lys His Ala Ala Lys Val Leu His Leu Gly	364
Lys Gly Cys Tyr Asn Asn Leu Ile Ile Ser Leu Ala Lys Lys	378
Pro Glu Lys Ser Asp Val	384

<210> 5
 <211> 1155
 <212> DNA
 <213> Coffea arabica

<220>
 <221> CDS
 <222> (1) ... (1152)

<400> 5	
atggagctcc aagaagtcct gcatatgaat gaaggatgaag gcgatacaag	50
ctacgcccaag aatgcatcct acaatctggc tcttgccaag gtgaaacctt	100
tccttgaaca atgcatacga gaattgttgc gggccaactt gccaacatc	150
aacaagtgc ttaaagttgc ggatttggga tgcgcttctg gaccaaacac	200
acttttaaca gtgcgggaca ttgtgcaaag tattgacaaa gtggccagg	250
aagagaagaa tgaattagaa cgtcccacca ttcagatttt tctgaatgat	300
cttttccaaa atgatttcaa ttcggttttc aagttgctgc caagcttcta	350
ccgcaaacct gagaaagaaa atggacgcaa gataggatcg tgcctaataa	400
gcgcaatgcc tggctctttc tacggcagac tcttccccga ggagtccatg	450
catTTTTTgc actcttgtta cagtgttcat tggttatctc aggttcccag	500
cggtttggtg attgaattgg ggattggtgc aaacaaaggg agtatttact	550
cttccaaagc aagtcgtccg cccgtccaga aggcataattt ggatcaattt	600

acgaaagatt ttaccacatt tctaaggatt cattcgaaag agttgttttc	650
acgtggccga atgctcctta cttgcatitg taaagtagat gaatacgacg	700
aaccgaatcc cctagactta cttgacatgg caataaacga cttgattgtt	750
gagggacatc tggaggaaga aaaattggct agtttcaatc ttccattctt	800
tacaccttca gcagaagaag taaagtgc atgttaggag gaaggttctt	850
ttgaaatttt atacctggag acttttaagg cccattatga tgctggcttc	900
tctattgatg atgattaccc agtaagatcc cttttccaag tatacggcga	950
tgaacatatt aaagcagagt atgtggcatc attaattaga tcagtttacg	1000
aacccatcct cgcaagtc atttggagaag ctattatgcc tgacttattc	1050
cacaggcttg cgaagcatgc agcaaagggt ctcacttgg gcaaaggctg	1100
ctataataat cttatcattt ctctcgccaa aaagccagag aagtcagacg	1150
tgtaa	1155

<210> 6

<211> 1155

<212> RNA

<213> Coffea arabica

<220>

<221> CDS

<222> (1) ... (1152)

<400> 6

auggagucc aagaaguuccu gcuaugaau gaaggugaag gcgauacaag	50
cuacgccaaag aaugcauccu acaaucuggc ucuugccaag gugaaaccuu	100
uccuugaaca augcauacga gaauuguugc gggccaacuu gccaacauc	150
aacaagugca uuaaaguugc ggauuuggga ugcgcucug gaccaaacc	200
acuuuuuaca gugcgggaca uugugcaaag uauugacaaa guuggccagg	250
aagagaagaa ugaauuagaa cguccacca uucagauuuu ucugaaugau	300
cuuuuacaaa augauuucaa uucgguuuuc aaguugcugc caagcuucua	350
ccgcaaacuc gagaaagaaa auggacgcaa gauaggauug ugccuaauaa	400
gcgcaaugcc uggcucuuuc uacggcagac ucuuucccga ggaguccaug	450
cauuuuuuugc acucuuguua caguguucau ugguuauuc agguucccag	500

cgguuuggug auugaaugg ggauuggugc aaacaaaggg aguauuuacu	550
cuuccaaaagc aagucguccg cccguccaga aggcauuuu ggaucauuu	600
acgaaagauu uuaccacauu ucuaaggauu cauucgaaag aguuguuuuc	650
acguggccga augcuccuaa cuugcauuug uaaaguagau gaauacgacg	700
aaccgaaucc ccuagacuua cuugacaugg caauaaacga cuugauuguu	750
gagggacauc uggaggaaga aaaaugggcu aguuucaauc uuccauucuu	800
uacaccuua gcagaagaag uaaagugcau aguugaggag gaagguucuu	850
uugaaaauuu auaccuggag acuuuuuagg ccuauuuga ugcuggcuuc	900
ucuauugaug augauuaccc aguaagaucc cauuccaag uauacggcga	950
ugaacauuu aaagcagagu auguggcauc auuaauuaga ucaguuuacg	1000
aacccauccu cgcaagucan uuuggagaag cuuuuagcc ugacuuauuc	1050
cacaggcuug cgaagcaugc agcaaagguu cuccacuugg gcaaaggcug	1100
cuauaauuu cuuaucauuu cucucgcaa aaagccagag aagucagacg	1150
uguuaa	1155

<210> 7

<211> 384

<212> PRT

<213> Coffea arabica

<400> 7

Met Glu Leu Gln Glu Val Leu His Met Asn Gly Gly Glu Gly	14
Asp Thr Ser Tyr Ala Lys Asn Ser Phe Tyr Asn Leu Phe Leu	28
Ile Arg Val Lys Pro Ile Leu Glu Gln Cys Ile Gln Glu Leu	42
Leu Arg Ala Asn Leu Pro Asn Ile Asn Lys Cys Ile Lys Val	56
Ala Asp Leu Gly Cys Ala Ser Gly Pro Asn Thr Leu Leu Thr	70
Val Arg Asp Ile Val Gln Ser Ile Asp Lys Val Gly Gln Glu	84
Lys Lys Asn Glu Leu Glu Arg Pro Thr Ile Gln Ile Phe Leu	98
Asn Asp Leu Phe Gln Asn Asp Phe Asn Ser Val Phe Lys Ser	112
Leu Pro Ser Phe Tyr Arg Lys Leu Glu Lys Glu Asn Gly Arg	126
Lys Ile Gly Ser Cys Leu Ile Gly Ala Met Pro Gly Ser Phe	140

Tyr Gly Arg Leu Phe Pro Glu Glu Ser Met His Phe Leu His	154
Ser Cys Tyr Cys Leu His Trp Leu Ser Gln Val Pro Ser Gly	168
Leu Val Thr Glu Leu Gly Ile Ser Ala Asn Lys Gly Cys Ile	182
Tyr Ser Ser Lys Ala Ser Arg Pro Pro Ile Gln Lys Ala Tyr	196
Leu Asp Gln Phe Thr Lys Asp Phe Thr Thr Phe Leu Arg Ile	210
His Ser Glu Glu Leu Ile Ser Arg Gly Arg Met Leu Leu Thr	224
Trp Ile Cys Lys Glu Asp Glu Phe Glu Asn Pro Asn Ser Ile	238
Asp Leu Leu Glu Met Ser Ile Asn Asp Leu Val Ile Glu Gly	252
His Leu Glu Glu Glu Lys Leu Asp Ser Phe Asn Val Pro Ile	266
Tyr Ala Pro Ser Thr Glu Glu Val Lys Cys Ile Val Glu Glu	280
Glu Gly Ser Phe Glu Ile Leu Tyr Leu Glu Thr Phe Lys Val	294
Pro Tyr Asp Ala Gly Phe Ser Ile Asp Asp Asp Tyr Gln Gly	308
Arg Ser His Ser Pro Val Ser Cys Asp Glu His Ala Arg Ala	322
Ala His Val Ala Ser Val Val Arg Ser Ile Phe Glu Pro Ile	336
Val Ala Ser His Phe Gly Glu Ala Ile Met Pro Asp Leu Ser	350
His Arg Ile Ala Lys Asn Ala Ala Lys Val Leu Arg Ser Gly	364
Lys Gly Phe Tyr Asp Ser Leu Ile Ile Ser Leu Ala Lys Lys	378
Pro Glu Lys Ser Asp Val	384

<210> 8

<211> 1155

<212> DNA

<213> Coffea arabica

<220>

<221> CDS

<222> (1) ... (1152)

<400> 8

atggagctcc aagaagtcct gcatatgaat ggaggcgaag gcgatacaag	50
ctacgccaaag aactcattct acaatctgtt tctcatcagg gtgaaacctt	100
tccttgaaca atgcatacaa gaattgttgc gggccaactt gcccaacatc	150
aacaagtgca ttaaagtgtc ggatttggga tgcgcttctg gaccaaacac	200

acttttaaca gttcgggaca ttgtacaaag tattgacaaa gttggccagg	250
aaaagaagaa tgaattagaa cgtcccacca ttcagatttt tctgaatgat	300
cttttccaaa atgatttcaa ttcggttttc aagtcgctgc caagcttcta	350
cgcgaaactt gagaaagaaa atggacgcaa aataggatca tgcctgatag	400
gcgcaatgcc tggctctttc tacggcagac tcttccccga ggagtccatg	450
cattttttac actcttgta ctgtttgcat tggttatctc aggttcccag	500
cggtttggtg actgaattgg ggatcagtc gaacaaaggg tgcatttact	550
cttccaaagc aagtcgtccg cccatccaga aggcatttt ggatcaattt	600
acgaaagatt ttaccacatt tcttaggatt cattcggag agttgatttc	650
acgtggccga atgctcctta cttggatttg caaagaagat gaattcgaga	700
acccgaattc catagactta cttgagatgt caataaacga cttggttatt	750
gaggacatc tggaggaaga aaaattggac agtttcaatg ttccaatcta	800
tgcaccttca acagaagaag taaagtgc atgttggag gaaggttctt	850
ttgaaatttt atacctggag acttttaagg tcccttatga tgcctggctc	900
tctattgatg atgattacca aggaagatcc cattccccag tctcctgcga	950
tgaacatgct agagcagcgc atgtggcatc tgtcgttaga tcaattttcg	1000
aacctatcgt cgcaagtc atttggagaag ctatcatgcc tgacttatcc	1050
cacaggattg cgaagaatgc agcaaaggtt cttcgtccg gcaaaggctt	1100
ctatgatagt cttatcattt ctctcgccaa aaagccagag aagtcagacg	1150
tgtaa	1155

<210> 9
 <211> 1155
 <212> RNA
 <213> *Coffea arabica*

<220>
 <221> CDS
 <222> (1) ... (1152)

<400> 9	
auggagucc aagaaguccu gcuaugauu ggaggcgaag gcgauacaag	50
cuacgccaag aacucauucu acaaucuguu ucucaucagg gugaaaccua	100